

Amendments to the Specification:

1. Please replace the paragraph at lines 14-22 on page 2 with the following amended paragraph:

However, there are several problems associated with pre-paid services. A first problem relates to services that are charged based on the duration or other metrics associated with an event. For example, it is rarely the case that a user will know in advance how long a phone call will last, or how many bytes of data will be transferred during a data session. As a result, it is not possible to calculate a charge until the event is over. This results in the possibility that a user will incur a charge that is greater than the amount available in their pre-paid account. In order to guard against this possibility, previous systems, at the initiation of an event, have reserved the entire amount available in the account rather than waiting to calculate the charge at the end of the event.

2. Please replace the paragraph at lines 28-29 on page 3 with the following amended paragraph:

FIG. 1 is a block diagram of an operating environment in which different embodiments of the invention may be practiced;

3. Please replace the paragraph at lines 6-25 on page 6 with the following amended paragraph:

Balance manager 102 is a computerized system operable to provide account balance management and rating services. In one embodiment of the invention, balance manager 102 receives requests to authorize and apply charges against pre-paid services. Examples of such charges include charges incurred as a result of downloading content from content servers 106, purchasing goods and/or services through an m-commerce server 108, and connection and airtime charges for voice and data connections controlled by IN platform 110. In general, balance manager 102 receives requests to authorize charges against an account associated with a wireless device 140. In the case of some content and goods or services, the charge may be known up-front and authorization is a relatively simple matter of comparing the charge amount with the pre-paid balance for the account associated with the wireless device 140. However, in the case of content and other downloads that may have connection and airtime charges, the charged amount cannot be determined up-front, because the number of service units required for a particular event is not known until the event has terminated. In order to handle such cases, the balance manager 102 determines whether the event should be authorized. In addition, in some embodiments, the balance manager 102 determines a number of service units to authorize and reserves a corresponding amount against the account. The reservation can be committed if the event completes successfully. Alternatively, the reservation can be cancelled

if the event does not complete successfully. Furthermore, the reservation can expire if the event does not complete within a predetermined amount of time. Further details on the reservation process are provided in the next section.

4. Please replace the paragraph at lines 26-30 on page 6 with the following amended paragraph:

Balance manager 102 is operably coupled to database 104. Database 104 maintains account information including an account identifier used to associate the account with one or more wireless devices (an example of which appears at 140) and account balance information. Database 104 can be any type of database system known in the art, the invention is not limited to any particular database management system.

5. Please replace the paragraph at lines 1-4 on page 7 with the following amended paragraph:

Convergent billing system 120 is also operably coupled to database 104. Convergent billing system 120 uses the data in database 104 to provide billing data to customer and employees of the network provider. Billing system 120 can provide the data using an interactive voice response system (IVR)122 or through a web-based "self-care" system 124.

6. Please replace the paragraph at lines 14-20 on page 8 with the following amended paragraph:

Next, the system executing the method reserves an amount against the pre-paid account 204. Typically the amount reserved will be less than the total amount available in the pre-paid account. This is desirable in order to allow multiple account users the opportunity to use the account to obtain services concurrently. Further details regarding the calculation of the reserve amount will be provided below in reference to FIG. 3. It should be noted that the reserved amount does not represent a committed charge, rather it represent an amount from the account that is not available for any other event while the reservation exists.

7. Please replace the paragraph at line 21 on page 8 through line 3 on page 9 with the following amended paragraph:

After the amount to reserve has been determined, the system determines the number of service units that should be authorized. In some embodiments of the invention, the service units are time units such as seconds, minutes or hours, and represent a duration for a call or data connection. The duration is calculated according to the amount reserved against the account. In addition, in some embodiments, the duration is also calculated according to the tariffs in effect for the type of call (e.g. local, long distance etc.). For example, if an amount equal to \$10.00 has been reserved and the tariff is \$0.20/minute, ~~than~~ then a duration of 50 minutes will be

authorized. In some embodiments, if the account does not have a minimum amount available to reserve, the event will not be authorized and the duration will be zero. In addition, the service units can represent a quantity of messages that are to be sent to and from the wireless device. As an example, if \$10.00 has been reserved and there is a charge of \$10.00/message, the 100 messages will be authorized. Data indicating the quantity of service units authorized is sent to the mobile device (block 206).

8. Please replace Table 1 appearing at line 13 on page 10 through line 1 on page 11 with the following amended Table 1:

Constant	Description
DefaultDurationToken	<p>The initial duration to use when rating a reservation event. This value should be chosen, balancing probability that the reservation is successful versus maximizing the size of the reservation token size. In one embodiment, the constant is selected such that 80% of events terminate within the default duration.</p> <p>The DefaultDurationToken is generally greater than the MinDurationToken.</p>
MinDurationToken	<p>This is the minimum duration that is reserved for a voice call. If a subscriber does not have enough balance to pay for this amount of duration, then the call will not be authorized.</p>
MaxNumberRateReturns	<p>This is the maximum number of rate and return calls to the Rating Engine per reservation request. The minimum this value can be is 2.</p>
CreditLowWaterMark	<p>If the Available Credit for a subscriber is below this value, all of the available credit may be reserved for a call.</p> <p><u>For example, if the available credit in a subscriber's account is \$3 and the CreditLowWaterMark is \$4, then the entire \$3 may be reserved by the system for a call. This merely provides the system with information that the available balance is low enough to use the entire amount as the reservation amount. As set forth below, however, the available credit must always be more than the reservation amount.</u></p>
CreditPerCallPercentage	<p>If the Available Credit for a subscriber is above the CreditLowWaterMark, then the maximum amount reserved for a single call is equal to Available Credit times the CreditPerCallPercentage. In some embodiments, if this value is less than the CreditLowWaterMark, then the maximum amount is the CreditLowWaterMark.</p>

	<p>For example, if this value is set to 50% and the available credit is \$20 and the CreditLowWaterMark is \$2, then the maximum amount reserved for a single call is \$10.</p> <p>Note that on subsequent reservation extensions for the same call, the available credit will be lower, thereby adjusting the maximum amount available to reserve.</p>
--	---

9. Please replace the paragraph at lines 3-12 on page 11 with the following amended paragraph:

The method begins when an event is received (block 302). Typically the event will be a request to authorize a charge against a pre-paid account. Data included with the event will be the type of call. However, the service and account associated with the event are typically not known at this point. Next, the event data is passed to a rating function, as well as duration equal to DefaultDurationToken (block 304). In some embodiments, the rating function is executed by a rating engine. Rating functions are known in the art, and apply tariffs and duration data to return a charge for a given call. The rating function returns the charge for the given default duration (block 305). This charge is referred to as the reservation amount. In some embodiments, the rating algorithm also identifies the account that the call should be billed to.

10. Please replace the paragraph at lines 1-5 on page 12 with the following amended paragraph:

Decision block 312 is the top of a loop that can iteratively adjust a reservation amount until either a successful reservation can be made (block 312), or failure is detected (block 318). In some embodiments of the invention, a counter (the Rate Return count) is maintained to insure that the loop is not executed more than MaxNumberRateReturns times. This is to ensure that the system response does not degrade due to repeated execution of the rating function.

11. Please replace the paragraph at lines 6-18 on page 12 with the following amended paragraph:

Decision block 312 checks to determine if the current reservation amount is appropriate. In one embodiment of the invention, the condition that must be met to determine that the reservation amount is appropriate is:

(Available Credit > reservation amount) AND
(
[Available Credit <= CreditLowWaterMark] OR

```
[reservation amount < Available Credit * CreditPerCallPercentage]  
)
```

If the current reservation amount is determined to be appropriate, then the method returns an indication of a successful authorization and the authorized duration (block 314). In addition, the current reservation amount is reserved against the account (block 315).

12. Please replace the paragraph at lines 18-28 on page 13 with the following amended paragraph:

An example function fCalcNewDuration that calculates this value is:

```
fCalcNewDuration(DesiredAmount# / RatedCharge# * Duration#)  
{  
    # Set the duration to be 60% of the duration for the linear rate.  
    Return 0.6 * DesiredAmount# / RatedCharge# * Duration#;  
}
```

The rating function or rating engine is then called with the new duration to determine a new reservation amount (block 322). In addition, in those embodiments maintaining a loop counter, Rate Return Count is incremented.

13. Please replace the paragraph at lines 19-30 on page 14 with the following amended paragraph:

Systems and methods for performing balance management in a pre-paid services environment are disclosed. The embodiments of the invention provide advantages over previous systems. For example, the systems and methods of the present invention provide a mechanism to determine an appropriate reservation amount that does not result in complete exhaustion of the user's pre-paid account, thereby leaving credit in the account to use for other services that may be concurrently accessed. For example, a user with a pre-paid account that desires to make voice calls while simultaneously accessing a content server can do so without worrying that the entire pre-paid account will be allocated to one service thereby resulting in the denial of the other service. Additionally, multiple users of a plurality of wireless devices associated with the same pre-paid account can access the account concurrently without fear that one user will allocate the entire account resulting in the denial of service to the other user of the pre-paid account.